

GOAL 1

CLEAN AIR

Protect and improve the air so it is healthy to breathe and free of levels of pollutants that harm human health or the environment.

Despite great progress in achieving cleaner, healthier air, air pollution continues to be a widespread human health and environmental problem in the United States as well as globally. Air pollution, both indoors and outdoors, can cause cancer, long-term damage to respiratory and reproductive systems, difficulty breathing, and premature death. Outdoor air pollution reduces visibility; damages crops, forests, and buildings; acidifies lakes and streams; contributes to the eutrophication of estuaries and the bioaccumulation of toxics in fish; diminishes the protective ozone layer in the upper atmosphere; contributes to the potential for world climate change; and poses additional risks to Native Americans and others who subsist on plants, fish, and game. Rapid development and urbanization in other countries are creating mega-cities with extreme air pollution which threatens not only those countries but also the United States, since air pollution can be transported great distances and across international boundaries. And air pollutants indoors often exist at comparable or higher levels.

Outdoor air pollutants come from many different sources: large stationary sources like electric power plants, industrial and chemical facilities, and incinerators; gasoline and diesel engine powered vehicles and equipment; agricultural activities; common, everyday activities like dry cleaning, filling a car with gas, and wood and trash burning; degreasing, varnishing, and painting activities; and natural sources like windblown dust and wildfires. Sources of indoor air pollution include combustion of oil, gas, kerosene, coal, wood, and tobacco products; building materials and furnishings such as carpet and pressed wood products; household cleaning products; and infiltrating outdoor or underground sources such as radon, pesticides, and outdoor air pollution.

Achieving further improvements in outdoor air quality—even maintaining gains made to date—will be difficult. Most “easy” successes have been won; reducing emissions further will be more contentious than in the past and, in some cases, will require public action. Reducing people’s exposure to indoor air pollutants will also be challenging. Further progress will require EPA and tribal, state, and local governments to work more collaboratively than in the past.

EPA intends to work closely with its partners and stakeholders to reduce pollution from electric generating and other stationary and mobile sources and indoor air pollution in schools and communities to protect millions of Americans from respiratory illness and other health risks. We will use regulatory, market-based, and voluntary programs to protect human health, global environments, and ecosystems

from the harmful effects of ozone depletion and climate change—restoring, fortifying, and safeguarding Earth’s precious resources for future generations. In developing and carrying out these programs, EPA will emphasize innovative approaches to regulations, policies, and non-regulatory measures. Our strategies include performance-based approaches; incentives and voluntary programs to achieve and surpass compliance; systems to integrate environmental management across facilities, problems, and media; initiatives to promote broad environmental stewardship; and cooperation with partners and stakeholders in the United States and internationally. Transboundary pollution threatens current air quality gains, and we will collaborate closely with neighboring countries and the international community to better understand the sources, fate, and effects of transboundary air pollution.

OBJECTIVES

Objective 1.1: Maintain and Improve Outdoor Air Quality. Through 2010, and consistent with established schedules, emissions of outdoor air pollutants will continue to decline, and ambient air quality will improve to or be maintained at levels that protect public health and the environment. In particular, air quality for ozone (8-hour) will improve to healthy levels for 52 percent of the people living in areas determined to have poor air quality in 2001, and air quality for fine particles will improve to healthy levels for 12 percent of the people who are living in areas determined to have poor air quality for fine particles in 2001. Healthy air for the other pollutants will be maintained for the 123.7 million people that had healthy air in 2001.

Sub-Objective 1.1.1: Reduce Emissions from Electric Generating Units and other Stationary Sources through Federal Regulations. By 2010, federal market-based and other regulatory programs will reduce emissions from electric generating unit and other stationary sources as follows:

Strategic Targets:

- By 2010, electric generating unit emissions of sulfur dioxide will be reduced by 4.6 million tons from their 2000 level of 11.2 million tons.
- By 2008, electric generating unit emissions of nitrogen oxides will be reduced by three million tons from their 2000 level of 5.1 million tons.
- By 2010, electric generating unit emissions of mercury will be reduced by 22 tons from their 2000 levels of 48

tons.

- By 2007, federal air toxics regulations will reduce air toxics emissions by 2.2 million tons from their 1993 level of 3.7 million tons.
- By 2009, EPA will promulgate the last group of area source standards, thus ensuring that 90 percent of the area source emissions of the 30 area sources listed in the Urban Air Toxics Strategy are regulated.

Sub-Objective 1.1.2: Reduce Emissions from Mobile Sources through Federal Regulations. By 2010, federal regulations will reduce emissions from mobile sources as follows:

Strategic Targets:

- By 2010, emissions of nitrogen oxides from mobile sources and fuels will be reduced by 3.7 million tons from their 2000 levels of 13.4 million tons.
- By 2010, emissions of volatile organic compounds from mobile sources and fuels will be reduced by 2.4 million tons from their 2000 levels of 7.3 million tons.
- By 2010, emissions of particulate matter from mobile sources and fuels will be reduced by 120,000 tons from their 2000 levels of 705,600 tons.
- By 2010, emissions of carbon monoxide from mobile sources and fuels will be reduced by 4.1 million tons from their 2000 levels of 75.6 million tons.
- By 2010, emissions of air toxics from mobile sources and fuels will be reduced by 1.1 million tons from their 1996 levels of 2.7 million tons.

Sub-Objective 1.1.3: Implement, Attain, and Maintain Air Quality Standards in Areas throughout the Country. By 2010, local air quality management programs will

build on emissions reductions achieved through federal regulations to maintain and improve air quality as stated in the objective.

Strategic Targets:

- In 2004, complete area designations, promulgate implementation rules, begin implementing the 8-hour ozone and PM_{2.5} NAAQS.
- By 2008, EPA will complete a policy on when Federal Implementation Plans are appropriate to bring Clean Air Act programs to Indian country.
- By 2008, the amount of air monitoring in Indian country will increase by 10 percent over FY 2003 levels of 158 monitors.

Sub-Objective 1.1.4: Reduce Air Toxics Risk at the Local Level. Through 2010, area-specific programs will build on the air toxics emissions reductions achieved through federal regulations to reduce exposure to ambient air toxics that may lead to adverse health effects including cancer and other significant health problems, and adverse environmental effects from air toxics in localities including Indian country.

Strategic Targets:

- ▼ By 2004, publicly release the revised National Air Toxics Assessment that is based on the 1999 inventory, and continue to update this national assessment of emissions, exposure, and risks from air toxics every three years.
- ▼ Air Toxics Monitoring: To be developed.
- ▼ By 2010, the tribes and EPA will have the information and tools to characterize and assess trends for 20 percent of Indian tribes from 2003 level of 1.2%.

Means and Strategies to Achieve Objective 1

The Clean Air Act distributes the responsibility for controlling air pollution and protecting people and the environment from its harmful effects among EPA, state, local, and tribal air pollution control agencies. Generally speaking, EPA develops policies, standards, regulations, programs, and strategies;

provides technical guidance and financial assistance; and develops and maintains the infrastructure for the Nation's air pollution control programs. State and local agencies are primarily responsible for implementing the Nation's air pollution control laws and regulations and for developing and implementing their own air pollution control regulations and programs. The discussion of outdoor air which follows reflects these differing roles and responsibilities. First, we focus on EPA's role in regulating, at the national level, large-scale or widespread sources of air pollutants that are found around the country such as mobile sources (cars, trucks, buses, construction equipment, snowmobiles, etc.) and stationary sources (power plants, oil refineries, chemical plants, dry cleaning operations, etc.). Then we focus on the lead role that state and local air pollution control agencies play in improving air quality in their areas and communities. EPA, states, and local agencies are committed to work together to meet goals for clean air cost-effectively.

Indian tribes have a unique status: EPA has a trust responsibility to protect air quality in Indian country, but tribes are also authorized and may choose to develop and implement their own air quality programs. The Clean Air Act Amendments of 1990 recognized tribal sovereignty and articulated Congress' intent to authorize tribes to carry out federal environmental programs for lands within their jurisdiction. Following the promulgation of the Tribal Authority Rule in 1998, many tribes began the first stages of developing tribal air programs. Challenges faced by EPA and tribes include increasing the currently very limited information on air quality on tribal lands, building tribal capacity to administer air programs in Indian country, and building effective EPA and state mechanisms to work with tribal governments on regulatory development, regional issues, and national policy.

Over the next several years EPA and its partners will focus on implementing the 1997 fine particle ($PM_{2.5}$) and ozone standards, further reducing emissions from electric generating units through the Clear Skies multi-pollutant approach, and implementing the air toxics program. We will also continue to work with multi-state planning groups to develop strategies for reducing haze and with individual states to develop implementation approaches to reduce emissions of particulate matter (PM) and ozone precursors.

To assist states in meeting clean air goals, we will proceed with federal programs aimed at achieving large, cost-effective reductions in PM and ozone-forming nitrogen oxide (NO_x) emissions. A cornerstone of our strategy is the Clear Skies Initiative, announced by President Bush in February 2002 and introduced as proposed legislation in Congress in July 2002. Through Clear Skies, EPA would set strict, mandatory emissions caps on three of the most harmful air pollutants from power generators—sulfur dioxide (SO_2), nitrogen oxides (NO_x), and mercury. As the proposed Clear Skies legislation moves forward, we will continue to implement the Acid Rain Program to reduce emissions of SO_2 and NO_x (the primary causes of acid rain) and the two NO_x trading programs, the NO_x Budget Programs under the Ozone Transport Commission and the NO_x State Implementation Plan (SIP) Call, to reduce the interstate transport of ozone.

The Clean Air Act requires EPA to control 188 toxic air pollutants, including benzene, which is found in gasoline; perchloroethylene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries. Other listed air toxics include dioxin, asbestos, toluene, and metals such as cadmium, mercury, chromium, and lead compounds. To date, EPA's air toxics activities have focused primarily on reducing emissions from large industrial sources through technology-based standards. Since 1990, the Agency has issued rules covering over 80 categories of major industrial sources such as chemical plants, oil refineries, aerospace manufacturers, and steel mills, as well as categories of smaller sources such as dry cleaners, commercial sterilizers, secondary lead smelters, and chromium electroplating facilities. These standards are projected to reduce annual air toxics emissions by about 1.5 million tons.

EPA's air toxics strategy will reduce exposures to air toxics through developing and implementing source-specific and sector-based federal standards and by conducting national, regional, and community-based initiatives that focus on reducing multi-media and cumulative risks. Significant effort will be needed to characterize the emissions and the resulting risks from those emissions on national and local scales. It will also be necessary to update the science and to keep the public informed about these issues. We will issue the remaining maximum achievable control technology standards on a schedule that avoids the need for case-by-case decisions by states and will address remaining risks from these sources and other smaller sources. We will continue to seek reductions of risks related to air toxics from mobile sources. We will continue to develop and refine tools, training, handbooks, and websites to assist our state, local, and tribal partners in characterizing risks from air toxics and work with them on strategies for making local decisions to reduce those risks. These efforts may include the establishment of "Centers of Excellence" (centralized sources of information) on measures and tools that EPA regional offices and state, local, and tribal governments can use to reduce risk at the local level from stationary, mobile, and indoor sources of air toxics, with an emphasis on voluntary and cost-effective measures. We also will compile and analyze the information from local assessments and use it to better characterize risk and assess priorities for further action, and we are working with state and local agencies to design a national toxics monitoring network. EPA will continue our efforts with the international community to address and reduce the risk from airborne persistent and bioaccumulative toxins (PBTs) transported across international boundaries.

Mobile sources continue to be a major contributor to outdoor air pollution. Over the past 30 years, EPA's national standards for vehicles, engines, and fuels have made remarkable advances in reducing on-road emissions. However, drastic increases in vehicle miles traveled have offset some of these advances, and more stringent standards and strategies are needed to provide further environmental benefits. EPA is now implementing a national standard-setting program that will dramatically reduce future emissions from a wide range of on-road/highway and non-road mobile sources including cars, minivans, sport utility vehicles, trucks, buses, motorcycles, recreational vehicles, forklifts, generators, marine engines, locomotives, and lawn and garden equipment.

Because of the projected emission reductions from these standards, emissions from heavy-duty non-road diesel engines (construction and farm equipment) will become a larger part of the mobile source inventory and will need to be addressed in the coming years. Thus, EPA is developing a program to establish new standards for these engines, including new sulfur requirements for non-road diesel fuel. A final rule for non-road engines and fuel is planned for 2004; benefits are expected to be similar to those from the on-road programs. This is an extremely important action as non-road engines are currently the biggest contributors to the PM emission problem from mobile sources.

EPA is also addressing diesel exhaust from both on-road and non-road sectors, not only through the establishment of new standards, but also through voluntary programs to reduce emissions from existing diesel engines in trucks, buses, and construction equipment. These programs will greatly reduce emissions of air toxics as well as criteria pollutants or their precursors.

We will continue to implement the reformulated gasoline program, while working to address issues associated with the use of oxygenates (e.g., methyl tertiary-butyl ether (MTBE) and ethanol). EPA will continue to partner with states, tribes, and local governments to create a comprehensive compliance program to ensure that vehicles and engines are clean, and we will continue to assist states in incorporating on-board diagnostic inspections into their vehicle inspection and maintenance programs. EPA will continue to assist states and local agencies in implementing the transportation conformity regulation and will propose and finalize changes to this regulation to address the revised ozone and PM standards. In addition, EPA will work with states and local governments to ensure the technical integrity of the mobile source controls in state implementation plans.

Although there are new rules regulating diesel emissions, the benefits of these rules will not be realized for at least 5 years. In the meantime, older, dirtier vehicles, often on the road for a million miles or more, will continue to adversely impact the Nation's health. EPA will expand its efforts to help create voluntary diesel retrofit projects to reduce PM from older, high-polluting trucks and buses, concentrating on areas with sensitive populations and with a particular focus on raising awareness of the problems of children riding to school in older, high-emitting diesel vehicles. Also, the SmartWay Transport partnership works with the trucking and railroad industry to achieve cleaner and more efficient vehicles and locomotives by adopting pollution control and energy saving technologies. To address the concern of idling trucks at truck stops and other rest areas, EPA will continue to develop partnership agreements with truck fleets, the truck stop industry, manufacturers of idle control technologies, and state and local governments to create incentives for implementation of idle control technologies and to remove barriers that truckers have identified.

EPA will work with tribes on a government-to-government basis to develop the infrastructure and skills tribes need to assess, understand, and control air quality on their lands. In consultation with our tribal partners, EPA will develop the necessary federal regulatory authorities and help develop tribal

programs to protect tribal air resources. The 1998 Tribal Authority Rule authorizes tribes to administer air programs in Indian country and, over the next few years, EPA will work with tribes to fashion and manage their own air programs, consistent with their traditions and culture. EPA will implement air quality programs directly where tribes choose not to develop their own programs. We will also support tribal air programs by providing technical support, assistance with data development, and training and outreach. EPA will help tribes participate in national policy and operations discussions and in regional planning and coordination activities.

EPA will work to better understand and take appropriate actions to address sources of air pollutants outside our borders that pose risks to public health and air quality within the United States. We will work with the National Oceanic and Atmospheric Administration, National Aeronautics and Space Administration, and other federal agencies to improve our capability to detect, track, and forecast the impacts of international sources of air pollutants, and we will engage and challenge the international scientific community to improve our understanding of the processes that drive international flows and our analytical tools for evaluating policy responses. Working through bilateral agreements and multilateral international organizations (such as the United Nations Environment Programme and the Organisation for Economic Cooperation and Development). EPA will promote efforts, including capacity building and technology transfer, to reduce foreign sources of pollution that pose risks to the United States. EPA will also help represent the United States in existing multilateral international agreements (such as the Convention on Long-Range Transboundary Air Pollution and United Nations Stockholm Convention on Persistent Organic Pollutants) to control sources of internationally transported pollutants and protect U.S. interests. In North America, EPA will work with Canada and Mexico to control the cross-border flow of pollutants, working within existing agreements (for example, the US-Mexico La Paz Agreement, the US-Canada Air Quality Agreement, and the North American Agreement on Environmental Cooperation). We will also work with Canada, Mexico, and key stakeholders to identify and explore new approaches to managing air quality along our common borders.

Objective 1.2: Indoor Air. By 2008, 4 million additional Americans than the 16 million in 2005 will be experiencing healthier indoor air in homes, schools, and office buildings.

Strategic Targets:

- ▼ Homes: By 2008, approximately 1,800,000 additional people will be living in homes with radon-resistant features along with children not being exposed to environmental tobacco smoke.
- ▼ Schools: By 2008, approximately 1,575,000 additional students and staff will

experience improved air quality in their schools.

- ▼ Workplaces: By 2008, approximately 720,000 additional office workers will experience improved air quality in their workplaces.

Means and Strategies to Achieve Objective 2

Peer-reviewed research indicates that the air within homes and other buildings can be more seriously polluted than the outdoor air even in the largest and most industrialized cities. Other research indicates that people spend approximately 90 percent of their time indoors. Thus many people face greater health risks from indoor pollution than they do from outdoor air pollution. Indoor air pollution has been ranked among the top four environmental risks in relative risk reports issued by EPA, the Science Advisory Board, and several states. In addition, people who may be exposed to indoor air pollutants for the longest periods of time are often those most susceptible to their effects: the young, the elderly, and the chronically ill, especially those suffering from respiratory or cardiovascular disease. To address indoor air quality issues, EPA does not generally regulate, but rather develops and implements voluntary outreach and partnership programs that inform and educate the public about indoor air quality and the actions they can take to reduce risks in their homes, schools, and workplaces. Through these voluntary programs, EPA disseminates information and works with state and local governments, industry and professional groups, and citizens to promote actions to reduce exposures to harmful levels of indoor air pollutants, including radon.

Outreach, in the form of educational literature, media campaigns, hotlines, and clearinghouse operations, provides essential information about indoor air health risks not only to the public, but also to the professional and research communities. The personnel, expertise, and credibility that non-governmental and professional entities bring to our partnerships allow EPA to reach a larger audience than we could on our own. Underpinning all of our efforts is a strong commitment to environmental justice, community-based risk reduction, and customer service.

EPA will continue to use partnerships with a variety of non-governmental and professional entities to improve the way in which all types of buildings, including schools, homes, and workplaces, are designed, operated, and maintained. Our national partner network includes over 30 organizations and more than 1,000 local field affiliates such as the American Academy of Pediatrics, American Lung Association, and National Council of La Raza. Targeted audiences include health care providers who treat children with asthma, school personnel who manage the environments where children spend many hours each day, county and local environmental health officials, and disproportionately-affected and disadvantaged populations. Through our partners, we will disseminate multimedia materials encouraging individuals, schools, and industry to take action to reduce health risks in their indoor environments. In addition, we will use technology transfer to improve the ways in which all types of

buildings, including schools, homes, and workplaces, are designed, operated, and maintained. This technology transfer includes providing detailed guidance on operations and maintenance to the building community (building owners and managers and schools' facility managers) and easy-to-use tools to educators and school facility managers. To support these voluntary approaches, EPA will incorporate the most current science available as the basis for recommending ways that people can reduce exposure to indoor contaminants.

EPA will also provide tribes with appropriate tools and assistance in addressing indoor air toxics concerns, such as radon or particulate and biological issues. EPA will work with other federal agencies to provide guidance and assistance on how to reduce the exposure levels of these contaminants in all Indian communities.

EPA will broaden awareness and action by working with national as well as local community-based organizations to design and implement programs that address critical indoor air quality problems, including radon, asthma, mold contamination, and secondhand smoke in homes, child care and school facilities, and other residential environments. Indoor environment programs will focus on expanding awareness of asthma triggers. EPA is targeting three primary audiences to help address indoor asthma triggers nationwide: the general public, schools and child care centers, and health care providers.

We will also continue the State Indoor Radon Grant Program to help states develop and implement programs to assess and mitigate radon. In addition to establishing the basic elements of an effective radon program in states that have not yet done so, we will support innovation and expansion in states that do have programs in place and strengthen federal-state partnerships by helping states develop radon program elements and activities.

Objective 1.3: Atmospheric Change. Through 2010, protect humans, global environments, and natural ecosystems by reducing the harmful effects of ozone depletion and climate change.

Sub-Objective 1.3.1: Climate Change. By 2010, U.S. greenhouse gas emissions will be reduced by about 170 million metric tons of carbon equivalent (MMTCE) compared to business-as-usual.

Sub-Objective 1.3.2: Stratospheric Ozone. By 2010, ozone concentrations in the stratosphere will have stopped declining and slowly begun the process of recovery, and the risk to human health from overexposure to ultraviolet (UV) radiation, particularly among susceptible subpopulations such as children, will be reduced.

Means and Strategies to Achieve Objective 3

Global air quality issues pose a daunting challenge. Releases of greenhouse gases (GHGs), with potentially far-reaching impacts on climate and sea level, will continue to increase worldwide. Because chlorofluorocarbons (CFCs) are extremely persistent in the atmosphere and are still widely used in many developing countries, stratospheric ozone depletion remains a significant problem with serious long-term health implications.

In the United States, energy consumption causes more than 85 percent of the major air emissions such as NO_x, carbon dioxide (CO₂), and SO₂. At the same time, American families and businesses spend over \$600 billion each year on energy bills—more than we spend on education. Technologies are available today that can cut this energy use significantly. Other technologies are being developed that may provide even more dramatic opportunities.

In February 2002, President Bush announced a new U.S. climate policy to reduce the GHG intensity of the U.S. economy by 18 percent over the next decade. EPA's strategy for helping to reduce GHGs is to work in partnership with businesses and other sectors through programs that deliver multiple benefits—from cleaner air to lower energy bills. At the core of these efforts are voluntary government-industry partnership programs designed to capitalize on the opportunities that consumers, businesses, and organizations have for making sound investments in efficient equipment, policies and practices, and transportation choices. In 10 years, we expect that more than half the nation's anthropogenic (man-made) GHG emissions will come from equipment purchased between now and then. Thousands of products are purchased every day, and often people buy inefficient equipment, thereby committing themselves to higher energy bills for 10 to 20 years at a time, depending upon the life of the equipment. At the same time, people often overlook investment opportunities represented by more efficient equipment.

EPA manages a number of efforts, such as the ENERGY STAR programs, the Commuter Choice Leadership Initiative, and the EPA Clean Automotive Technology program, to remove barriers in the marketplace and more quickly deploy technology in the residential, commercial, transportation, and industrial sectors of the economy. On the international front, EPA will continue activities that provide multiple benefits at the global and local levels. These include global reductions in GHG emissions that can be achieved by recognizing and providing support for in-country environmental issues, such as improving local air quality, increasing energy access and efficiency, promoting cleaner production, providing transportation alternatives, and managing solid waste effectively (for methane reduction).

Over the next several years, EPA will build on its voluntary government/industry partnership efforts to achieve even greater GHG reductions by taking advantage of additional opportunities to simultaneously reduce pollution and energy bills. EPA will continue to break down market barriers and foster energy efficiency programs, products and technologies, cost effective renewable energy, and greater transportation choices. EPA will continue to work closely with state and local partners to

assess the air quality, health, and economic benefits of reducing GHG emissions and developing practical risk reduction strategies. It will establish international partnerships that will link industrial efficiency, reduction of GHGs, and sustainable development. Specifically, EPA will work in the following areas.

Buildings

The Buildings Sector, which contributes more than one-third of U.S. GHG emissions, is one of the largest areas for potential GHG emission reduction and, at the same time, represents one of EPA's most successful efforts. EPA will expand upon the ENERGY STAR partnerships that have been successful in profitably reducing GHG emissions (including ENERGY STAR Labeling, ENERGY STAR Buildings Program, and ENERGY STAR Homes).

Industry

EPA will continue to build on the success of the voluntary programs in the industrial sector, focusing on reducing CO₂ emissions and continuing the highly successful initiatives to reduce methane emissions and emissions of the high-global warming potential gases. EPA's goals for these efforts are to work with the U.S. Department of Energy (DOE) to accelerate the rate of energy and resource efficiency improvements in industry between now and 2010; to return, cost-effectively, emissions of methane to 1990 levels or below by 2010; to limit, cost-effectively, emissions of the more potent greenhouse gases (hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride); and to facilitate the use of clean energy technologies and purchase of renewable energy.

Transportation

EPA will continue to build and enhance efficient and effective market-driven programs that address the transportation sector's contribution to climate change. The transportation sector contributes about one-third of the inventory of U.S. GHG emissions. Key to this effort are the SmartWay Transport Partnership and the Commuter Choice Leadership Initiative. The SmartWay Transport Partnership works with the trucking and railroad industry to achieve cleaner and more efficient vehicles and locomotives by adopting pollution control and energy-saving technologies. The Commuter Choice Leadership Initiative offers innovative solutions to commuting challenges faced by U.S. employers and employees by promoting commuter benefits that reduce vehicle trips and miles traveled.

The Agency's Clean Automotive Technology (CAT) Program will further advance clean and fuel-efficient automotive technology to protect the environment better and to save energy. CAT efforts in 2002 focused on achieving significant fuel economy gains by beginning to transfer these technologies from passenger cars to typical large domestic trucks. For the next 5 to 10 years, the CAT Program will

focus on research and collaboration with the automotive industry, applying EPA's unique knowledge of hydraulic hybrid technology and advanced clean-engine technologies to personal vehicles such as large sport-utility vehicles (SUVs), pickup trucks, and urban delivery trucks. Through these agreements, significant EPA technologies will be demonstrated in real-world applications and introduced commercially by vehicle manufacturers between 2005 and 2010.

The CAT Program commits EPA to develop technology by the end of the decade to satisfy stringent criteria emissions requirements and double fuel efficiency in personal vehicles such as SUVs, pickups, and urban delivery vehicles while meeting demands for size, performance, durability, and power. For a large SUV with a baseline fuel economy of 17 miles per gallon (mpg), the resulting fuel economy levels would be 25.5 to 28.9 mpg in 2006 and up to 34 mpg by 2010. Expanding this technology into 50 percent of new light trucks by 2020 would generate annual fuel savings of 8 billion gallons and a reduction in carbon emissions of 25 million metric tons of carbon equivalent (MMTCE).

EPA will also play a unique role in the development of fuel cell and hydrogen fuel vehicles by establishing the capability to test a range of fuel cell vehicles and components; taking the national lead in establishing emissions and fuel economy testing protocols and developing innovative, safe procedures for laboratory handling of hydrogen fuel; establishing a peer-reviewed life cycle model and promoting its use in decision making; and working closely with other key stakeholders through public/private partnerships, like the California Fuel Cell Partnership, to facilitate the commercialization of innovative technologies.

Carbon Removal

EPA will continue efforts to build domestic and international consensus around the integration of carbon sequestration (carbon capture, separation, and storage or reuse) activities into a comprehensive climate strategy. Carbon can be sequestered through changes in both forestry and agricultural practices, but these actions are not currently well understood or accepted in many sectors of the international and environmental communities. EPA is working collaboratively with the U.S. Department of Agriculture (USDA) to address misconceptions regarding carbon sequestration and to ensure that this important mitigation option is developed in an environmentally sound and economically efficient way. EPA and USDA will identify and develop specific opportunities to sequester carbon in agricultural soils, forests, other vegetation and commercial products, with collateral benefits for productivity and the environment.

State and Local

States and localities have a significant and an important role in reducing GHGs, provided they are equipped with the tools they need to consider climate change issues in their daily decisions. EPA's

State and Local Program responds to this need by providing guidance and technical information about the air quality, health, and economic benefits of reducing greenhouse gas emissions and developing practical risk reduction strategies. EPA will continue its efforts to build capacity and to provide state and local governments with technical, outreach, and education services about climate change impacts, mitigation and adaptation, and related issues so that state and local governments may more effectively and comprehensively address their environmental, human health, and economic goals.

International Capacity Building

EPA is working with a number of key developing countries to help them (1) design and implement programs to increase the use of low and zero GHG technologies; (2) identify, evaluate and implement strategies for achieving multiple social and health or economic benefits while reducing GHG emissions; (3) design market-based systems to facilitate more significant actions to reduce GHG emissions by these countries under the United Nations Framework Convention on Climate Change (UNFCCC) as well as the infrastructure necessary to implement these actions; and (4) accurately assess GHG emissions from the transportation sector and implement less energy intensive transportation strategies. Over the next 10 years, EPA's goals are to promote significant increases in voluntary, market-driven programs for increasing the use of low and zero GHG technologies; to fully integrate climate considerations into countries' development plans; and to establish the technical and institutional basis for major developing countries to take significant actions under the UNFCCC.

Scientific evidence amassed over the past 25 years has shown that chlorofluorocarbons (CFCs), halons, hydrochlorofluorocarbons (HCFCs), methyl bromide, and other halogenated chemicals used around the world are destroying the stratospheric ozone layer. The stratospheric ozone layer protects life on earth from harmful ultraviolet (UV) radiation; a depleted ozone layer allows more UV radiation to reach the earth. Increased levels of UV radiation can lead to a greater chance of overexposure and consequent health effects including skin cancer, cataracts, and other illnesses.¹ Today, one in five Americans develops skin cancer. Cataracts diminish the eyesight of millions of Americans and cost billions of dollars in medical care each year.

As a signatory to the *Montreal Protocol on Substances that Deplete the Ozone Layer* (Montreal Protocol), the United States is obligated to regulate and enforce its terms domestically. In accordance with this international treaty and related Clean Air Act requirements, EPA will continue to implement the domestic rule-making agenda for the reduction and control and ozone-depleting substances (ODSs) and enforce rules controlling their production, import, and emission. This includes combining market-based regulatory approaches with sector-specific technology guidelines and facilitating the development and commercialization of alternatives to methyl bromide and HCFCs. We will strengthen outreach

¹ World Meteorological Organization, Scientific Assessment of Ozone Depletion: 1998, February 1999.

efforts to ensure efficient and effective compliance and continue to identify and promote safer alternatives to curtail ozone depletion. To help reduce international emissions, we will assist with the transfer of technology to developing countries and work with them to accelerate phase-out of ozone depleting compounds.

Because the ozone layer is not expected to recover until the mid-21st century at the earliest, the public will continue to be exposed to higher levels of UV radiation than existed prior to the use and emission of ODSs. Recognizing this and the public's current sun-exposure practices, EPA will continue education and outreach efforts to encourage behavioral changes as the primary means of reducing UV-related health risks. We will continue to reach out to children (a particularly vulnerable population) through the SunWise School Program.

The Agency will advance its objective for atmospheric change through science and continued research in energy efficiency, emerging clean energy technologies, greenhouse gases and ozone, ozone-depleting substances, and human health issues. Over the next several years, we will use a variety of tools to achieve our objectives, including human capital strategies to maintain and secure expertise in atmospheric change assessments and analyses, voluntary and regulatory programs, market-based regulatory approaches, and public outreach.

Objective 1.4: Radiation. Through 2008, EPA and its partners and stakeholders will minimize unnecessary releases of radiation and be prepared to minimize impacts to human health and the environment should unwanted releases occur.

Sub-Objective 1.4.1: Radiation Protection. Through 2008, minimize radioactive releases of EPA-regulated radioactive waste and minimize impacts from radiation exposure.

Strategic Target: By 2008, the total number of drums of radioactive waste certified by EPA as properly disposed will increase to 140,171 from 47,171 in 2003.

Sub-Objective 1.4.2: Emergency Response. By 2008, ensure Agency readiness to protect the public from airborne releases of radiation by performing enhanced training and exercises and using state-of-the art equipment.

Strategic Target: By 2008, the percentage of EPA Radiation Emergency Response Team members that meet scenario-based response criteria will increase to 80 percent from 50 percent in 2005, and the percentage of the U.S. population covered by the National Radiation Monitoring System will increase to 60 percent from 24 percent in 2003.

Means and Strategies to Achieve Objective 4

The mining and processing of naturally occurring radioactive materials for use in medicine, power generation, consumer products, and industry inevitably generate emissions and waste. EPA is the primary federal agency charged with protecting people and the environment from harmful and avoidable exposure to radiation, and it is the lead federal agency for responding to international emergencies involving radioactive materials. EPA also provides guidance and training to other federal and state agencies in preparing for emergencies at U.S. nuclear plants, transportation accidents involving shipments of radioactive materials, and acts of nuclear terrorism. EPA sets protective limits on radioactive emissions for all media—air, water, and soil—and develops guidance for cleaning up radioactively contaminated Superfund sites.

EPA will continue to set priorities in waste management, clean material, and risk assessment to reduce the risk to the public of excessive radiation. One of EPA's major radiation-related responsibilities is to certify that all radioactive waste shipped by DOE to the Waste Isolation Pilot Plant (WIPP) is permanently disposed of safely and according to standards. Biennially, DOE submits documentation of compliance with applicable environmental laws and regulations, and EPA must determine whether DOE is in continued compliance. Every 5 years EPA must re-certify that the WIPP likely will comply with EPA's radioactive waste disposal regulations.

EPA will continue implementing the clean materials program by working with other federal agencies such as the Nuclear Regulatory Commission (NRC), DOE, U.S. Customs Department, and Department of State, as well as with state agencies and international organizations to prevent metals and finished products suspected of having radioactive contamination from entering the country. EPA will also work with states, local agencies, and tribes to locate and secure lost, stolen, or abandoned radioactive sources within the United States.

EPA's Radiological Emergency Response Team (RERT), a component of EPA's emergency response structure, will continue to prepare for incidents in which EPA is the designated Lead Federal Agency (LFA) under the Federal Radiological Emergency Response Plan as well as preparing to support other Lead Federal Agencies as appropriate. For example, EPA is the LFA for international radiological events and lost or orphan radioactive source incidents. EPA will support NRC for domestic nuclear power plant accidents and DOE for accidents at their weapons complex facilities.

Recognizing our expanding role in Homeland Security, EPA will also strengthen its national radiation monitoring capabilities to improve the Agency's ability to inform decision makers about risk from radiological emergencies to improve EPA's response. While the enhanced system will primarily support EPA's Homeland Security efforts, it can also be used to support EPA's traditional radiological

response activities.

EPA will provide national-level guidance on the risks posed by radioactive materials in the environment, including technical guidance for conducting risk assessments in order to limit public exposure to radiation. We will accomplish this by working with the public, industry, states, tribes, and other governmental agencies to use information systems and to inform and educate people about radiation risks and promote actions that reduce human exposure. EPA, in partnership with other federal agencies, will promote management of radiation risks in a consistent and safe manner at Superfund, DOE, Department of Defense, state, local and other federal sites. We will also continue to provide radioanalytical and mixed waste analytical data on environmental samples to support site assessment and clean-up activities and will coordinate with other nations on selected radiological issues, including risk assessment methodologies and risk management approaches.

Through the Radiation Program, EPA will ensure we have appropriate methods to manage radioactive releases and exposures. Approaches to meet this objective will include health risk site assessments, risk modeling, clean-up and waste management activities, national radiation monitoring, radiological emergency response, and provision of federal guidance to our international, federal, state, and local partners.

Objective 1.5: Science/Research. Through 2010, provide and apply a sound scientific foundation to EPA's goal of clean air by conducting leading-edge research and developing a better understanding and characterization of environmental outcomes under Goal 1.

Sub-Objective 1.5.1: Science to Support Air Programs. Through 2010, utilize the best available scientific information, models, methods and analyses to support air-program-related guidance and policy decisions.

Sub-Objective 1.5.2: Air Pollution Research. Through 2010, provide methods, models, data, and assessment research associated with air pollutants. Criteria pollutant research will focus on emissions, fate and transport, exposures, mechanisms of injury, and health effects of criteria air pollutants, and is designed to support both the periodic revision of National Ambient Air Quality Standards and their implementation and to develop scientific information and tools to understand and characterize environmental outcomes associated with criteria pollutants. Air toxics research will develop and improve air quality models and source receptor tools; cost-effective pollution prevention and other control options; and scientific information and tools to understand and characterize environmental outcomes associated with nationwide, urban, and residual air toxic risks.

Means and Strategies to Achieve Objective 5

Air pollution research carried out under this goal is designed to enable EPA to meet its objectives for clean outdoor and indoor air. EPA's Office of Research and Development (ORD) has developed multi-year plans for research on PM, tropospheric ozone (and other criteria pollutants), and air toxics which lay out long-term goals and describe targets the Agency intends to meet to reduce scientific uncertainties.

Particulate Matter

EPA's research on PM represents the largest portion of the Clean Air research program. In building this program, EPA has been guided by expert advice from the National Research Council of the National Academy of Sciences, and from several other organizations outside the Agency. PM research goals are being addressed through the use of in-house laboratory resources and partnering with numerous academic institutions, including five PM Research Centers around the Nation.

The PM research program focuses on reducing scientific uncertainties related to the exposure and health effects of PM to support statutory review under the National Ambient Air Quality Standards (NAAQS) and promote cost-effective implementation of NAAQS. From FY 2003 to FY 2007, research will focus on developing data and tools needed for implementation of the current PM standard and for the next required review of the standard. Because there is a 5-year cycle for review of NAAQS, research in later years will focus on the information needed to determine whether standards should be retained or revised and to implement new or revised standards.

Under its multi-year plan for PM research, EPA has established five long-term goals to support development and implementation of PM NAAQS. Within the 5-year scope of this *Strategic Plan*, we will:

- Develop and transfer to states new data and tools to predict, measure, and reduce ambient PM and PM emissions to attain the existing PM NAAQS;
- Advance the development and transfer of new exposure, epidemiological, toxicological, and clinical data for improved assessments of health risks associated with short- and long-term exposure to PM in the general and selected susceptible populations;
- Work to improve environmental decision makers' capabilities to ensure that PM NAAQS are adequately protective of human health by assessing the state of the science that integrates atmospheric, exposure, health, and engineering information and providing consultation on NAAQS promulgation;

- Advance the development and transference to states of improved data and tools to attain existing PM NAAQS and to refine the environmental factors related to health risks associated with PM exposure; and
- Advance development and transfer of new exposure, epidemiological, toxicological, and clinical data for improved assessments of health risks associated with short- and long-term exposure to PM, especially in susceptible populations.

Tropospheric Ozone

The tropospheric ozone research program addresses not only ozone, but other criteria pollutants such as SO₂, nitrogen dioxide, carbon monoxide, and lead. It focuses on developing tools to help with implementation of NAAQS, such as improving emissions estimates and modeling capabilities, and on developing the scientific criteria documents upon which NAAQS (and NAAQS reviews) are based. EPA's ozone research will continue to be an in-house program, with no extramural grants.

EPA has established three long-term goals for ozone research, which address development and implementation of air quality standards. Within the 5-year scope of this *Strategic Plan*, we will:

- Advance the provision of Air Quality Criteria Documents, research needs documents, and consultation on the proposal and promulgation of the periodic review of the NAAQS for ozone, nitrogen oxides, and carbon monoxide;
- Support implementation and attainment of 8-hour ozone NAAQS by EPA, states, and tribes by providing evaluated state-of-science modeling, monitoring, and other tools and information and training Agency and state staff on their use; and
- Advance the provision of regionally evaluated models and methods to attain 8-hour ozone NAAQS, focusing on remaining non-attainment areas and maintenance plans.

Air Toxics

The Air Toxics research program is designed to answer critical scientific questions that will result in more certain risk assessments and more effective risk management practices for stationary point, area, mobile, or indoor sources of air toxics. Research on air toxics is presently being addressed almost exclusively by utilizing the resources of in-house laboratories and research centers. In future years, EPA will consider the use of extramural research grants to complement the intramural program.

Under its multi-year plan for air toxics research, EPA has established long-term goals for reducing

uncertainties in risk assessments and implementing risk reduction. Within the 5-year scope of this *Strategic Plan*, we will:

- ▼ Advance the provision of health hazard and exposure methods, data, and models to help reduce uncertainty in risk assessments of acute, chronic, and multi-pathway exposures to air toxics at the national and regional levels and the conduct of community-level exposure and epidemiology studies to characterize the risk of air toxics at that scale; and
- ▼ Produce 15 new or modified tools (methods, models, or assessments) that enable national, regional, state, and local officials to identify or implement cost-effective approaches to reduce risks from stationary point, area, mobile, or indoor sources of air toxics.

HUMAN CAPITAL STRATEGY

To help achieve cleaner, healthier air across the United States, EPA is charged with researching and assessing air quality and regulating air pollutants. To accomplish this mission, the Agency collaborates with state, tribal, local, and other environmental partners to perform risk and economic assessments, set national standards, and implement market-based and voluntary programs. EPA's current air and radiation workforce consists of highly specialized scientists and engineers, attorneys, grants managers, and mission support specialists.

Over the next several years, EPA will continue to carry out its clean air mission through federal regulation of stationary and mobile sources and area-specific air quality and air toxics management. One important aspect of this work is using market-based and voluntary programs that require close collaboration between EPA and its partners. To accomplish this work, EPA will need to maintain a highly skilled technical workforce with enhanced leadership and management competencies.

Under EPA's human capital strategy, each EPA air and radiation professional, from interns to senior executives, will seek to develop a comprehensive set of leadership and management competencies. Between 2003 and 2008, EPA will continue to enhance its technical and communication capabilities as it works closely with a variety of environmental partners. Our strategy to identify, assess, and fill skill deficiencies through 2008 includes the following activities:

- Craft a workforce development strategy tailored to the critical developmental needs of the air and radiation workforce;
- Develop a recruitment plan to attract a diverse pool of candidates with essential competencies;
- Implement a 360 degree feedback program to improve managers' supervisory skills; and
- Continue to implement a permanent and rotational assignment program, mentoring and coaching

programs, and formal training activities to enhance and diversify employees' work experiences.

PROGRAM EVALUATION

Program evaluation results did not significantly influence development of the Agency's goals and objectives for achieving clean air.

EXTERNAL FACTORS

Weather conditions and meteorological patterns have very important effects on air quality. For example, high temperatures and bright sunlight can increase the formation of ozone. Wind can carry air pollution from one area to another, while conditions of little or no wind can cause air pollutants to remain in an area and build up to unhealthy levels. These effects must be considered when developing and implementing plans and strategies to reduce emissions and achieve and maintain clean air. On the other hand, plans to improve air quality can help ensure protection of public health even in the face of adverse weather conditions.

Achieving our environmental objectives depends on state implementation of delegated air programs, state and local implementation of federal regulations, and state and local agencies' implementation of their own air pollution control regulations and programs. Many states are currently facing reduced budgets and resource constraints which may impact their ability to carry out environmental protection programs.

Lawsuits and court action may also impact EPA's ability to achieve its objectives, by requiring the Agency to adjust schedules and delay accomplishment of certain goals and objectives. Achievement of the clean air objectives can also be affected by economic conditions and development patterns in the United States and the world and by choices made for energy and transportation policies.

Finally, some objectives and sub-objectives under this goal are based on or assume enactment and implementation of the Clear Skies legislation proposed by the President. As this proposed legislation is still in the early stages of the legislative process, it is not possible to predict at this time what action the Congress will take.